



Health Bulletin

Parent's exposure to ionizing radiation and cancer among their children

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In 1990 a British study suggested that a father's exposure to radiation before he conceived children might be a cause of leukemia and non-Hodgkin's lymphoma in his children. Leukemia is a cancer of white blood cells and lymphomas are cancers of the lymph tissues throughout the body. In the British study, the leukemia risk among their children was greatest for fathers with the highest radiation exposure.

The National Institute for Occupational Safety and Health funded a study in 1993, of workers at the Hanford Site, Idaho National Engineering and Environmental Laboratory, and the Oak Ridge Reservation. In addition to childhood (age 15 and under) leukemia and lymphoma, cancers of the brain and central nervous system were included.

Children for the study were selected to meet the following criteria: The children had to be born in one of the counties associated with these Department of Energy (DOE) facilities so that the parents had the potential for employment at that facility. The child's cancer had to be diagnosed during the period 1957 - 1991. Each child with cancer was compared to 4-5 children without cancer of the same sex, age, and age of mother at conception of her child.

DOE plant radiation and employee records were reviewed to determine the father's and mother's employment history and total radiation dose prior to conception of the children in the study.

Only external sources of radiation were considered because few parents had measured internal exposures.

The NIOSH study found that for all three DOE sites considered together, and for all three types of cancer combined, the father's or mother's total radiation dose prior to conception of a child was not associated with the risk of cancer. Because there were few mother's who worked at the sites the final report provided detailed information only for fathers. For the fathers, there was no association of total radiation dose prior to conception of a child with any cancer at any of the three DOE sites.

Researchers also reported that the risk of brain and central nervous system cancer was slightly higher among the children whose parents worked at the Hanford Site. The slight increase was not associated with the parent's radiation dose before the child's conception. Other plant information about the parent's work did not provide insights into this observation. More recent studies in Europe and North America provide no evidence for a role of parental work place exposure to radiation prior to a child's conception in the development of childhood cancer.

The NIOSH study was presented in 1998 to workers and community members at each of the three DOE sites. The results of this study have been provided to committees that review and make recommendations regarding radiation health protection standards in the United States. A copy of the full report is available at DOE reading rooms. If you have any questions you may contact Dr. Gerald Petersen on (301) 903-2340.